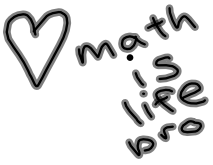
4/26/17

"Too many of us are not living our dreams because we are living our fears." -Les Brown

HW: "Area Between Curves" #3 and #4
Test 1 on Tuesday 5/2

AIM: Area Between Curves cont.



Area between 2 curves:

$$\text{Area} = \int_a^b (\text{Top} - \text{Bottom})\, dx$$

where a, b are the points of intersection that form the area in question.

1) $y = 4x - x^2$

$y = 3$

a) To find Points of intersection set equations equal.

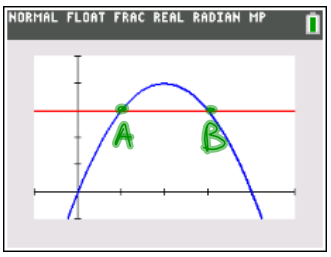
$4x - x^2 = 3$

$0 = x^2 - 4x + 3$

$0 = (x-3)(x-1)$

$x = 3 \quad x = 1$

$B = (3,3) \quad A = (1,3)$



$$\text{Area} = \int_a^b (\text{Top} - \text{Bottom})\,dx$$

$$\text{Area} = \int_1^3 \left(4x - x^2 - (3)\right) dx$$

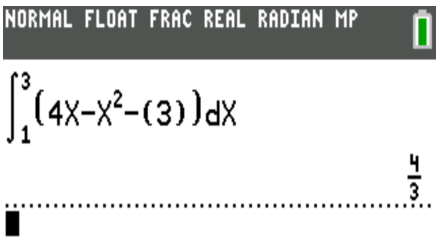
$$\text{Area} = \frac{4x^2}{2} - \frac{x^3}{3} - 3x \Big]_1^3$$

$$\text{Area} = \left(\frac{4(3)^2}{2} - \frac{3^3}{3} - 3(3)\right) - \left(\frac{4(1)^2}{2} - \frac{(1)^3}{3} - 3(1)\right)$$

$$= \left(18 - 9 - 9\right) - \left(2 - \frac{1}{3} - 3\right)$$

$$= 0 - \left(-\frac{4}{3}\right)$$

$$= \frac{4}{3} \text{ units}^2$$



2) $y = 2x^2 - 25$ ← Bottom

$y = x^2$ ← Top

Find x-values of Points of intersection:

$x^2 = 2x^2 - 25$

$-x^2 \quad -x^2$

$0 = x^2 - 25$

$0 = (x+5)(x-5)$

$x = -5 \quad x = 5$

$$\text{Area} = \int_{-5}^{5} \left(x^2 - (2x^2 - 25)\right) dx$$

NORMAL FLOAT FRAC REAL RADIAN MP

$\int_{-5}^{5}(X^2-(2X^2-25))dX$

$\frac{500}{3}$

Area = $\frac{500}{3}$ units^2